

Problem Set 2 (10 points)

1. Two candidates, A and B , compete in an election. The outcome of this election depends on the vote of only two citizens. Of the two citizens, one supports candidate A and the other supports candidate B . Each citizen decides whether to vote, at a cost c , for the candidate she supports, or to abstain. A citizen who abstains receives the payoff of 2 if the candidate she supports wins, 1 if this candidate ties for the first place, and 0 if this candidate loses. A citizen who votes receives the payoffs $2 - c$, $1 - c$, and $-c$ in these three cases, where $0 < c < 1$.
 - (a) List the players, the actions for each player, and the preferences in this game. (1 point)
 - (b) Draw a game matrix for this game. (1 point)
 - (c) What is the Nash equilibrium (equilibria) of this game? (2 points)
 - (d) Except for the names of the actions and players, is the game the same as one the classic games we have discussed in class? (1 point)
2. Consider a variant of the Stag Hunt game. Suppose that instead of two there are N hunters and only M out of the N hunters need to pursue the stag in order to catch it, where $N \geq 3$ and $M \geq 2$. Assume that a captured stag is shared only by the hunters who catch it and that they share it equally. Each hunter prefers the fraction $1/N$ of the stag to a hare.
 - (a) List the players, the actions for each player, and the preferences in this game. (1 point)
 - (b) Suppose $N = 3$ and $M = 2$. What is the Nash equilibrium (equilibria) of this game? (2 points)
 - (c) Suppose again that $N = 3$ and $M = 2$. Now however, while each hunter prefers the fraction $1/M$ of the stag to a hare, each hunter prefers a hare to any fraction

of the stag that is smaller than $1/M$. What is the Nash equilibrium (equilibria) of this game? (2 points)